



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/784,045	02/20/2004	Jim D. Meador	32849	6833

7590 02/08/2005

Hovey Williams LLP
Suite 400
2405 Grand Blvd.
Kansas City, MO 64108

EXAMINER

MOORE, MARGARET G

ART UNIT	PAPER NUMBER
----------	--------------

1712

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/784,045	MEADOR ET AL.	
	Examiner	Art Unit	
	Margaret G. Moore	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 to 88 is/are pending in the application.
- 4a) Of the above claim(s) 1 to 40 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 41, 42, 44-48, 50, 52-54, 56-58, 60-63, 65, 67, 68, 71, 72, 75, 76, 78-81, 83, 85 and 86 is/are rejected.
- 7) ☒ Claim(s) 43, 49, 51, 55, 59, 64, 66, 69, 70, 73, 74, 77, 82, 84, 87 and 88 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 February 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>6/2/07</u> | 6) <input type="checkbox"/> Other: ____. |

Art Unit: 1712

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1 to 40, drawn to a composition, classified in class 526, subclass 279.
 - II. Claims 41 to 88, drawn to a composition, classified in class 528, subclass 32.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions of Group I and Group II are related as combination and subcombination. Inventions in this relationship are distinct if it can be shown that (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability, and (2) that the subcombination has utility by itself or in other combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not require the particulars of the subcombination as claimed because the combination (Group I) does not require the polyhedral oligomeric silsesquioxane required in Group II. The subcombination has separate utility such as a coating composition on its own, or an additive to plastics or as an optical waveguide. Note too that the subcombination need not be in the form of a polymer (i.e. it can be monomeric).

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a telephone conversation with Tracy Bornman on 1/28/04 a provisional election was made without traverse to prosecute the invention of Group II, claims 41 to 88. Affirmation of this election must be made by applicant in replying to this Office action. Claims 1 to 40 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one

Art Unit: 1712

or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

6. The drawings are objected to because Figures 3, 4 and 6 are not legible. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

7. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. Note that the claims are directed to a composition containing specific silsesquioxane compounds. The title should reflect the essence of the claims.

8. Claims 46, 47, 54, 56, 62 and 80 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 46, 47, 62 and 80:

It is improper to define R^2 in the backbone of the polymer as hydrogen, alkyls

Art Unit: 1712

and aryls as this is a divalent group.

Claims 54 and 56:

This claim is confusing, as it appears to be missing a word(s). Specifically, "an anti-reflective coating intermediate said substrate and said layer" does not make sense. Perhaps "between" should be found after "intermediate"?

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

11. Claims 41, 42, 44 to 48, 50, 53, 58, 60 to 63, 65, 71, 76, 78-81, 83 are rejected under 35 U.S.C. 102(b) as being anticipated by Lichtenhan et al.

Initially the Examiner notes that the phrase for use in microlithographic processes is a future intended use clause that does not appear to carry any weight on the instant claims since the claim itself is fully defined by the components therein. This includes the structure claim, since the substrate can be any substrate.

Lichtenhan et al. teaches polyhedral oligomeric silsesquioxanes (POSS). See for instance Formula 2 on column 6, in which Z is a reactive group. Col. 8, line 61, teaches

Art Unit: 1712

that the silsesquioxanes have high solubility. This anticipates claims 41 and 42 wherein the constituent is a compound. Also note the polymer prepared in Example 2. This anticipates instant claims 41 and 44 wherein the constituent is a polymer. See also column 3, lines 14 - 18, which teach the methacrylate Z groups corresponding to claim 44. Both the teaching that the polymers have high solubility and the example, which prepares the polymers in a solvent, meet the requirement in claim 41 that the constituent be dissolved or dispersed in a solvent system.

Regarding claims 45 to 47, the Examiner notes that these are further limitations on the polymer in claim 41, but claim 41 does not require that the polymer be present. Thus, even though Lichtenhan et al. fail to teach these monomer units, these claims do not require that the polymer be present and as such these limitations need not be met by anticipate these claims.

With regard to claim 48, note the bottom of column 3 which teaches that the polyhedral oligomeric silsesquioxane (meeting the compound in claim 41) can be reacted with a comonomer, which meets the term "crosslinking agent". Note too that Example 1 prepares a triblock copolymer from the POSS, reacting the POSS with a crosslinking agent. This reaction also uses a catalyst, meeting claim 50.

Regarding claim 53, note column 10, line 10, which teaches using the polymers therein as coating compositions. As the skilled artisan would immediately envision, a coating composition must be applied to a substrate, thereby meeting the requirement of a substrate having a layer therein, wherein said layer is prepared from the compound or polymer as defined in claim 53. Similarly, for claim 71, note that forming the coating in Lichtenhan et al. will necessarily require that the composition containing the polymer be applied to a substrate. In this manner claim 71 is met by this reference. The limitations of claims 58, 60 to 63, 65, 76, 78 to 81 and 83 have been addressed above, in the composition claims.

12. Claims 52, 67 and 85 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Lichtenhan et al.

The prior art fails to specifically teach the spin bowl compatability of the composi-

Art Unit: 1712

tion therein. The compositions, however, are the same. When applicants claim a composition in terms of a function, property or characteristic and the prior art composition is the same as that claimed but the function is not explicitly disclosed by the reference, the examiner may make a rejection under both 35 U.S.C. 102 and 103, expressed as a 102/103 rejection. "There is nothing inconsistent in concurrent rejections for obviousness under 35 U.S.C. 103 and for anticipation under 35 U.S.C. 102." *In re Best*, 562 F.2d 1252, 1255 n.4, 195 USPQ 430, 433 n.4 (CCPA 1977). This same rationale should also apply to product, apparatus, and process claims claimed in terms of function, property or characteristic. Therefore, a 35 U.S.C. 102/103 rejection is appropriate for these types of claims as well as for composition claims. See MPEP 2112 (III).

13. Claims 41, 42, 44 to 48, 50, 53, 54, 57, 58, 60 to 63, 65, 71, 72, 75, 76, 78 to 81 and 83 are rejected under 35 U.S.C. 102(e) as being anticipated by Angelopoulos et al.

This reference incorporates by reference the teachings of Lichtenhan et al. See column 5, lines 36 and on. Thus for reasons consistent with those given supra, the novelty of many of these claims has already been addressed. For clarity, however, the Examiner will detail the teachings of Angelopoulos per se as they apply to the claims.

Column 5, lines 36 and on, teaches a polymer having POSS recurring units. This corresponds to claim 44 (though such a polymer is necessarily prepared from a monomer meeting claim 42). See also column 7, lines 6 to 8, which teaches a solvent. The Examiner relies on the rationale noted in paragraph 11, above for claims 45 to 47. On the other hand, note that the POSS compounds can be grafted onto the backbone of polyhydroxystyrene (column 5, line 44). Column 3 details the desirability of having a hydroxyl group attached to the polymers (column 3, lines 26 to 57). Such a polymer will meet the requirements of claim 45. The bottom of column 6 teaches claims 48 and 50.

Column 8, lines 4 to 10, teaches the substrate required by claim 53, as well as claim 57. Column 8, lines 14 to 18, teaches the anti-reflective coating of claim 54. This teaches the method of claim 71 as well.

Art Unit: 1712

14. Claims 52, 67 and 85 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Angelopoulos et al.

See paragraph 12, *supra*, as the same rationale noted therein presently applies.

15. Claims 68 and 86 are rejected under 35 U.S.C. 103(a) as being unpatentable over Angelopoulos et al.

Angelopoulos et al. fail to teach a specific thickness for the layer. Col. 8, line 24, teaches that the thickness should be as thin as possible. This would motivate the skilled artisan to form an extremely thin coating. Where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. Also, discovering an optimum value of a result effective variable involves only routine skill in the art. It would appear to have been within routine experimentation and/or optimization to arrive at a thickness that falls within this claimed range.

16. Bonafini, Jr. et al. is cited as being of general interest. This teaches polymer reaction products of POSS compounds, but fails to teach or suggest a coating composition or using the polymers in a solvent. Note that these polymers are used to form contact lenses, which does not require a solvent.

17. Applicants' claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. However, the provisional application upon which priority is claimed fails to provide adequate support under 35 U.S.C. 112 for claims 41 to 88 of this application. The provisional application is completely silent as to the POSS based composition being examined. As such the journal article "Polyhedral Oligomeric Silsesquioxane..." by E. Tegou et al. qualifies as prior art against the instant claims (which have an effective filing date of 2/20/04). This article, however, is no closer to the claims than Angelopoulos, cited *supra*. To avoid redundancy, a rejection over this article has not been made.

18. Claims 43, 49, 51, 55, 59, 64, 66, 69, 70, 73, 74, 77, 82, 84, 87 and 88 are objected to as being dependent upon a rejected base claim, but would be allowable if

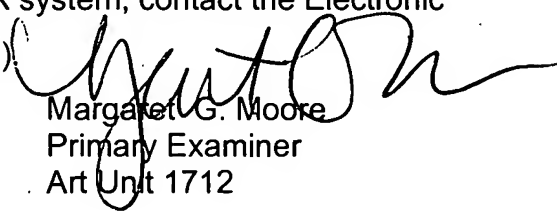
Art Unit: 1712

rewritten in independent form including all of the limitations of the base claim and any intervening claims. For claims 43, 59 and 77 the prior art fails to teach or suggest such a compound having the hydroxypropyldimethylsilyloxy groups. For claims 49, 64 and 82, the prior art fails to teach or suggest an aminoplast crosslinking agent. For claims 51, 66 and 84, the prior art fails to teach or suggest a weak acid and a strong acid in combination (page 7 of applicants' specification defines these terms). For claims 55, 69, 70, 73, 74, 87 and 88, the prior art fails to teach or suggest forming a photoresist layer on top of the POSS containing layer. Claim 56 would be allowable if amended to overcome the 35 USC 112 rejection.

19. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Margaret G. Moore whose telephone number is 571-272-1090. The examiner can normally be reached on Monday to Wednesday and Friday, 10am to 4pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Randy Gulakowski can be reached on (571) 272-1302. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Margaret G. Moore
Primary Examiner
Art Unit 1712

mgm
2/4/05